

What Is Claimed Is:

1           1.     A method to compensate for stress-induced deflection in a compound  
2     microprobe, the microprobe including a substrate, a microcantilever extending  
3     outwardly from the substrate, and a film formed on the microcantilever, said method  
4     comprising the steps of:

5                     determining an amount of stress-induced deflection of the  
6     microcantilever; and

7                     mounting the microprobe so as to compensate for the stress-induced  
8     deflection.

1           2.     The method of Claim 1, wherein said mounting step includes selecting a  
2     compensation piece based upon the amount of stress-induced deflection.

1           3.     The method of Claim 2, wherein the compensation piece is a wedge  
2     generally aligning the microcantilever with a deflection detection apparatus.

1           4.     The method of Claim 2, wherein said step of selecting the compensation  
2     piece comprises correcting an angle between a longitudinal axis of the microcantilever  
3     and the substrate so as to insure that light reflected from the microcantilever during  
4     operation contacts a detector of a deflection detection apparatus.

1           5.     The method of Claim 4, wherein said selecting step includes selecting a  
2     dimension of the compensation piece.

1           6.     The method of Claim 5, wherein the compensation piece is a wedge and  
2     the dimension is an angle between a microcantilever mounting surface of the wedge and  
3     a base of the wedge.

1           7.     The method of Claim 6, wherein said mounting step includes attaching  
2     substrate to the mounting surface.

1           8.     The method of Claim 2, wherein said mounting step includes coupling a  
2     bottom surface of the substrate to the compensation piece.

1           9.     The method of Claim 2, wherein the stress-induced deflection is a static  
2     deflection caused by the film.

1           10.    A microprobe assembly including a microcantilever and a substrate  
2     coupled to a support, the microprobe assembly comprising:  
3                 a compensation piece disposed intermediate the support and the  
4     substrate, said compensation piece configured to compensate for an amount of static  
5     deflection of the microcantilever.

1           11.    The microprobe assembly of Claim 10, wherein said compensation piece  
2     is a wedge-shaped structure having a mounting surface and a base.

1           12.    The microprobe assembly Claim 11, wherein an angle between said  
2     mounting surface and said base is selected based on the static deflection so as to align  
3     the microcantilever to a deflection detection apparatus.

1           13.    The microprobe assembly of Claim 10, wherein the compensation piece  
2     is formed integrally with the support.

1           14.    The microprobe assembly of Claim 10, wherein said compensation piece  
2     is made of an insulating material.

1           15.    A method of compensating an amount of static deflection associated with  
2   at least one microprobe of a first planar array of microprobes, each microprobe of the  
3   array including a substrate, a microcantilever extending outwardly from the substrate,  
4   and a film formed on the microcantilever, the method comprising the steps of:  
5                directing a beam of light towards a first microprobe of the first array of  
6   microprobes;  
7                reflecting the beam off the microcantilever of the first microprobe;  
8                determining a first amount of static deflection based on the reflected  
9   beam; and  
10              selecting a first microprobe compensation piece based upon the first  
11   amount of deflection.

1           16.    The method of Claim 15, further comprising the step of mounting the  
2   first microprobe on the first selected microprobe compensation piece.

1           17.    The method of Claim 15, further comprising the step of:  
2                mounting each of the microprobes of the first planar array of  
3   microprobes on a compensation piece having the same shape as the first selected  
4   microprobe compensation piece.

1           18.    The method of Claim 15, further comprising the step of:  
2                repeating said directing, reflecting, determining and selecting steps for  
3   each of the microprobes of the first array of microprobes;  
4                and then mounting each of the microprobes on a corresponding  
5   compensation piece having a shape selected according to a corresponding amount of  
6   static deflection.

1           19.    The method of Claim 15, wherein the first compensation piece is a  
2   wedge.

1           20.    The method of Claim 19, wherein the wedge includes a base and a  
2    mounting surface defining an angle.

1           21.    The method of Claim 20, wherein said selecting step includes computing  
2    the angle based on said determining step.

1           22.    The method of Claim 16, further comprising the step of:  
2                   integrally forming the first array of microprobes from a single wafer  
3    prior to the directing step.

1           23.    The method of Claim 15 further comprising the step of:  
2                   mounting each of a second planar array of microprobes on a  
3    corresponding compensation piece shaped according to the first selected microprobe  
4    compensation piece.

1           24.    The method of Claim 23, including the steps of:  
2                   integrally forming the first array of microprobes from a first wafer; and  
3                   integrally forming the second array from a second wafer.

1           25.    The method of Claim 15, further comprising the steps of:  
2                   mounting the first array of microprobes on an X-Y translating stage  
3    configured to translate in a plane parallel to the first array prior to said directing step;  
4    and  
5                   removing the first array from the X-Y translating stage.

1           26.    The method of Claim 25, further comprising the step of:  
2                    translating the stage to a first position in which the first microprobe of  
3 the first array of microprobes is disposed in an optical path defined by the beam,  
4 wherein said translating step is performed prior to said directing step;  
5                    moving, after said selecting step, the stage to a second position in which  
6 a second microprobe of the first array of microprobes is disposed in the optical path;  
7                    reflecting the beam off a microcantilever of the second microprobe;  
8                    determining a second amount of deflection of the beam indicative of an  
9 amount of static deflection of the microcantilever of the second microprobe;  
10                   selecting a second microprobe compensation piece based upon the second  
11 amount of deflection; and  
12                   repeating said moving, directing, reflecting, determining and selecting  
13 steps for each microprobe of the first array of microprobes.

1           27.    The method of Claim 26, wherein the first and second compensation  
2 pieces are wedge-shaped.

1           28.    The method of Claim 27, wherein the compensation pieces each have a  
2 base and a mounting surface defining a corresponding angle.

1           29.    The method of Claim 28, wherein the corresponding angles of the  
2 compensation pieces are different.

1           30.    The method of Claim 25, wherein the translating stage is motor-driven.

1           31.    The method of Claim 28, wherein the compensation pieces are made of  
2 an insulating material.

1           32.    A compound microprobe assembly comprising:  
2                   a microprobe mount;  
3                   a microprobe coupled to said microprobe mount, the microprobe having  
4 an amount of static stress-induced deflection; and  
5                   wherein said microprobe mount is configured so as to compensate for the  
6 amount of static deflection.

1           33.    The microprobe assembly of Claim 32, wherein said microprobe mount  
2 includes a support and a compensation piece having a shape corresponding to the  
3 amount of static deflection.

1           34.    The microprobe assembly of Claim 33, wherein the compensation piece  
2 is a wedge generally aligning the microprobe with a deflection detection apparatus.

1           35.    The microprobe assembly of Claim 33, wherein said support and said  
2 compensation piece are integrally formed.